In the Claims

1. (Original) A microdischarge device, comprising:

a first layer having a tapered cavity disposed therein;

an intermediate layer on the first layer; and

a second layer on the intermediate layer, the intermediate layer electrically insulating the first layer from the second layer, the first and second layers having a conductivity larger than that of the intermediate layer.

2. (Original) The microdischarge device of claim 1, wherein the cavity has an inverted square pyramidal shape.

3. (Original) The microdischarge device of claim 1, wherein the first layer is a semiconductor.

4. (Original) The microdischarge device of claim 3, wherein the first layer comprises Si.

5. (Original) The microdischarge device of claim 3, wherein the first layer, the intermediate layer and the second layer form a diode, and the intermediate layer is a depletion region of the diode.

6. (Original) The microdischarge device of claim 1, wherein the intermediate layer comprises at least one dielectric layer.

7. (Previously presented) The microdischarge device of claim 5, wherein an angle of taper of the cavity is at least 20 degrees and at most 60 degrees.

8. (Previously presented) The microdischarge device of claim 5, wherein an area of the cavity at a surface of the first layer is not greater than 10^4 μm^2.

9. (Original) The microdischarge device of claim 5, wherein a depth of the tapered cavity in the first layer is not greater than 100 μm.

10. (Original) The microdischarge device of claim 5, wherein the first layer comprises Si.

11. (Original) The microdischarge device of claim 5, wherein the lifetime of the device is at least 10 hours.

12. (Previously presented) The microdischarge device of claim 6, wherein an angle of taper of the cavity is at least 20 degrees and at most 60 degrees.

13. (Previously presented) The microdischarge device of claim 6, wherein an area of the cavity at a surface of the first layer is not greater than 10^4 μm^2.

14. (Original) The microdischarge device of claim 6, wherein a depth of the tapered cavity in the first layer is not greater than 100 μm.

15. (Original) The microdischarge device of claim 6, wherein the first layer comprises Si.

16. (Original) The microdischarge device of claim 6, wherein the lifetime of the device is at least 10 hours.

17. (Original) The microdischarge device of claim 6, wherein the intermediate layer comprises a plurality of dielectric layers, at least two of the plurality of dielectric layers having different dielectric constants.

18. (Original) The microdischarge device of claim 1, wherein the cavity extends through at least a surface of the second layer.

19. (Original) The microdischarge device of claim 1, wherein side walls of the cavity are coated with a film that reflects light.

20. (Original) The microdischarge device of claim 1, further comprising a gas disposed in the cavity.

21. (Original) The microdischarge device of claim 1, wherein the second layer comprises an electrically conducting screen disposed on an end of the cavity.

22. (Original) The microdischarge device of claim 21, wherein the screen serves as a cathode of the microdischarge device.

23. (Original) The microdischarge device of claim 1, further comprising an optically transmissive material that seals the cavity.

24. (Original) The microdischarge device of claim 1, wherein the first layer serves as a cathode of the microdischarge device.

25. (Original) An array comprising a plurality of microdischarge devices according to claim 1.

26. (Currently Amended) The array of microdischarge devices of claim ~~15~~25, wherein the array is divided into independently excited sub-arrays.

27. (Currently Amended) A lighting array comprising the array of microdischarge devices according to claim ~~15~~25.

28. (Original) A laser comprising a plurality of the microdischarge devices according to claim 1.

29. (Original) A microdischarge device, comprising:

a semiconductor layer having a tapered cavity disposed therein;

an intermediate layer on the semiconductor layer; and

a second layer on the intermediate layer, the intermediate layer electrically insulating the semiconductor layer from the second layer.

30. (Previously presented) The microdischarge device of claim 29, wherein the semiconductor layer comprises Si.

31. (Previously presented) The microdischarge device of claim 29, wherein the semiconductor layer, the intermediate layer and the second layer form a diode and the intermediate layer is a depletion region of the diode.

32. (Previously presented) The microdischarge device of claim 29, wherein the second layer is a metal.

33. (Previously presented) The microdischarge device of claim 31, wherein an angle of taper of the cavity is at least 20 degrees and at most 60 degrees.

34. (Previously presented) The microdischarge device of claim 31, wherein an area of the cavity at a surface of the semiconductor layer is not greater than 10^4 μm^2.

35. (Original) The microdischarge device of claim 31, wherein a depth of the non-cylindrical cavity in the semiconductor layer is not greater than 100 μm.

36. (Original) The microdischarge device of claim 31, wherein the semiconductor layer comprises Si.

37. (Original) The microdischarge device of claim 31, wherein the lifetime of the device is at least 10 hours.

38. (Previously presented) The microdischarge device of claim 32, wherein an angle of taper of the cavity is at least 20 degrees and at most 60 degrees.

39. (Previously presented) The microdischarge device of claim 32, wherein an area of the cavity at a surface of the semiconductor layer is not greater than 10^4 μm^2.

40. (Original) The microdischarge device of claim 32, wherein a depth of the non-cylindrical cavity in the semiconductor layer is not greater than 100 μm.

41. (Original) The microdischarge device of claim 32, wherein the semiconductor layer comprises Si.

42. (Original) The microdischarge device of claim 32, wherein the lifetime of the device is at least 10 hours.

43. (Original) The microdischarge device of claim 29, wherein the intermediate layer comprises at least one dielectric layer having a lower electrical conductivity than the semiconductor and second layers.

44. (Original) The microdischarge device of claim 43, wherein the intermediate layer comprises a plurality of dielectric layers, at least two of the plurality of dielectric layers having different dielectric constants.

45. (Original) The microdischarge device of claim 29, wherein the cavity extends through at least a surface of the second layer.

46. (Original) The microdischarge device of claim 29, wherein side walls of the cavity are coated with a film that reflects light.

47. (Original) The microdischarge device of claim 29, further comprising a gas disposed in the cavity.

48. (Original) The microdischarge device of claim 29, wherein the second layer comprises an electrically conducting screen disposed on an end of the cavity.

49. (Original) The microdischarge device of claim 48, wherein the screen serves as a cathode of the microdischarge device.

50. (Original) The microdischarge device of claim 29, further comprising an optically transmissive material that seals the cavity.

51. (Original) The microdischarge device of claim 29, wherein the semiconductor layer serves as a cathode of the microdischarge device.

52. (Original) An array comprising a plurality of microdischarge devices according to claim 29.

53. (Original) The array of microdischarge devices of claim 52, wherein the array is divided into independently excited sub-arrays.

54. (Previously presented) A lighting array comprising the array of microdischarge devices according to claim 52.

55. (Original) A laser comprising a plurality of the microdischarge devices according to claim 29.

56-74. (Cancelled)

75. (Previously presented) The microdischarge device of claim 1, wherein the cavity has trapezoidal cross-section.

76. (Previously presented) The microdischarge device of claim 29, wherein the cavity has trapezoidal cross-section.